

IN THE CLAIMS:

The below listed set of claims replaces all listings previously submitted.

1. (Previously Presented) A heat exchanger or reactor comprising a stack of parallel plates, wherein

each plate of the stack having perforations defining an array of spaced column precursors of thickness equal to the plate thickness,

said column precursors being joined together by ligaments having a thickness less than the plate thickness,

each ligament extending between a pair of adjacent column precursors such that the column precursors of any one plate being coincident in the stack with the column precursors of any adjacent plate, whereby the stack is provided with an array of individual columns, each column extending perpendicularly to the plane of the plates;

whereby fluid flowing through the stack is forced to follow a tortuous flow path around the columns, and has the ability to flow parallel to the plane of each said plate.

2. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein the headers are provided within the profile of the plate.

3. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein there comprises an arrangement of interlinking ligaments between adjacent column precursors.

4. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein there comprises a plurality of ligaments connected to each said precursor.

5. (Canceled)

6. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein each plate is provided within the profile of the plate with apertures which stack together to provide one or more header tanks.

7. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein each said ligament extending between a pair of adjacent column precursors is displaced relatively adjacent to ligaments positioned above and/or below said ligament.

8. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein the top and bottom of the stack are closed by unperforated plates.

9. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein the stack has side plates which are formed by the stacking of unperforated border regions around the edges of individual plates of the stack, the unperforated border regions being integrally formed as part of the plate.

10. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein the perforations in the plates and the reduced thickness of the ligaments are produced by photochemical etching or spark erosion.

11. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein at least two differently perforated plates are used, the two plates having different ligament patterns.

12. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein the column precursors are of circular cross section.

13. (Canceled).

14. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein the perforated plates are of metal of thickness 0.5 mm or less.

15. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein the components of the stack are diffusion bonded together.

16. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein the components of the stack are brazed together.

17. (Previously Presented) A heat exchanger or reactor according to claim 16, wherein the plates of the stack are provided at their edges with extensions to assist location of the plates in the stack.

18. (Previously Presented) A heat exchanger or reactor according to claim 1, wherein each plate is provided with extensions in the form of loops which stack together to provide one or more tanks at the sides of the stack.

19. (Previously Presented) A heat exchanger or reactor according to claim 18, wherein the loops are reinforced by cross-members.

20. (Previously Presented) A heat exchanger or reactor according to claim 1, further comprising a plurality of stacks of plates and one pair of adjacent stacks are separated by a plate having perforations to allow controlled injection of fluid at higher pressure from one stack into fluid at lower pressure in an adjacent stack.

21. (Previously Presented) A heat exchanger or reactor according to claim 1, further comprising a plurality of passageways to contain catalytic material, said passageways being separated by an intervening plate from the stack of parallel perforated plates.

22. (Previously Presented) A heat exchanger or reactor according to claim 21, wherein the passageways to contain the catalytic material are defined between plates having parallel ribs running the length of the plates.

23. (Previously Presented) A heat exchanger or reactor according to claim 21, wherein the passageways to contain the catalytic material are closed at one or both of their ends by mesh material.

24. (Previously Presented) A heat exchanger or reactor according to claim 1, further comprising a plurality of joined stacks of the parallel perforated plates, each stack being separated from an adjacent stack by a solid unperforated plate whereby two or more separate fluid stream passageways are provided.

25. (Cancelled)